Amino acids fortification of low-protein diet for broilers under tropical climate: ideal essential amino acids profile

ABSTRACT

A three-week trial was conducted to determine the effect of lowering dietary protein level (DPL) with optimal amino acid (AA) profile on growth performance, blood metabolites, and relative weights of abdominal fat and internal organs in broiler chickens raised under tropical hot and humid environment. Five isocaloric (3023 metabolisable energy/kg) starter (1-21 days) experimental diets were formulated in a gradual crude protein (CP) decline from 22.2 (control) to 16.2% by 1.5% interval. All diets were meeting or exceeding National Research Council recommendations except CP and metabolisable energy. The formulations were also adjusted to contain 1.1 digestible Lys to meet the ideal AA ratios concept. Body weights (BW), weight gains (WG), feed intake and feed conversion ratio of groups with 19.2, 20.7 and 22.2% DPL were not significantly different. However, BW and WG suppressed ($P<0.05$) with 16.2 and 17.7% DPL. Feeding the 16.2% CP diet significantly reduced serum total protein and uric acid, but increased serum triglyceride ($P<0.05$). Moreover, relative heart weights increased ($P<0.05$) but no changes occurred in liver and abdominal fat weights in chicks with 16.2% DPL. In summary, CP of broilers starter (1-21 days) diet can be reduced till 19.2% with essential AA fortification and without any adverse effect on growth performance under the hot, humid tropics.

Keyword: Amino acids fortification; Broilers; Tropical climate